



PORTLAND CEMENT FIELD SECTION 1019

1019.1 SCOPE. To establish procedures for inspecting, sampling, and accepting Portland cement at the source and destination and to establish a list of qualified cement sources. The list of qualified sources is shown in [Field Section FS-1019 Table 1](#) of this Manual.

1019.2 APPARATUS. Keep all sample containers and equipment used in sampling cement clean and free of moisture or any foreign material. It is important that the sample be kept in airtight, moisture-proof containers from the time it is obtained until tests are started. The apparatus consists of:

- (a) Canvas bags with plastic liners.
- (b) Rubber bands for securely fastening the top of plastic liners.
- (c) Slotted tube, tube sampler, scoop or any other device suitable for obtaining the sample.
- (d) Labeling materials.

1019.3 PROCEDURE.

1019.3.1 Source Acceptance and Qualification. All Portland cement for use in MoDOT projects must be furnished from a qualified manufacturer or terminal and must comply with the requirements of Specification Sec 1019. The procedures for qualification are listed in Specification Sec 1019. Direct questions from potential suppliers concerning qualification to the Central Office. The latest copy of each manufacturer's quality control plan is to be kept on file in the Central Office. Send any updates to the quality control plan direct to the Chemical Laboratory Director.

With approval of the State Construction and Materials Engineer, small quantities of specialty cement may be sampled and inspected at destination. This approval will be granted infrequently and only under circumstances where it is difficult or impractical to comply with the acceptance procedures in Specification Sec 1019.

1019.3.2 Inspection and Sampling. The Field Materials Chemist may coordinate with the manufacturer to obtain a semi-annual split sample for each approved cement plant. Complete a sample record in SiteManager showing manufacturer, silo number, type and other pertinent information. Designate sample type as a "Split Sample". The manufacturer shall furnish the manufacturer's test results to the Field Materials Chemist within two weeks after completion.

1019.3.3 Disqualified Facilities. Manufacturers that fail to comply with the qualified status as set forth in Specification Sec 1019 will be required to designate the silo(s), bin(s), or storage facility from which they propose to furnish cement for MoDOT projects. The producer must sample, test, and report satisfactory test results for each designated silo, bin, or storage facility. Prior to any shipment and following a satisfactory report furnished to the Chemical Laboratory Director, each silo, bin, or storage facility will be sampled and



sealed by the Field Materials Chemist. If the results of testing by the Central Laboratory are satisfactory, the sealed silo, bin, or storage facility will be approved. This procedure will continue until adequate quality control has been re-established.

1019.3.2 Destination Inspection of Approved or Company Certified Cement.

1019.3.2.1 The ready-mix, precast, or paving plant operators shall furnish a copy of the bill of lading or delivery receipt for each shipment to MoDOT work.

1019.3.2.2 Use the following procedure to sample cement on paving jobs and at ready-mix plants. Samples shall weigh a minimum of 5 lb [2.5 kg]. Obtain the samples from the storage bin or weigh hopper just prior to incorporation into the mix to represent the material being used. Truck samples are not normally acceptable for destination sampling.

1019.3.2.3 Take a sample at the rate of one per 9000 cubic yards [6900 cubic meters] of concrete produced for each paving plant with a maximum number of one per day and promptly submit to the Central Laboratory.

1019.3.2.4 At ready-mix or precast plants, take a sample at the rate of one per 9000 cubic yards [6900 cubic meters] of concrete produced for Missouri Department of Transportation work, or as directed by MoDOT, with a minimum of one sample every other month, during the period that the ready-mix or precast plant is furnishing concrete for Department work. If a ready-mix or precast plant is using more than one type or source of cement for Department work, the samples should be taken alternately to cover the different types or sources.

1019.3.2.5 Place samples taken at destination in a canvas bag containing a plastic liner and ship to the Central Laboratory. Complete a sample record in SiteManager showing the manufacturer, type, and other pertinent information such as contractor, plant location, and county. The sample type shall be designated as a "Proj - Check Sample". "Proj - Check Sample" is to be selected even for precast work when the items made are for stock.

1019.3.3 Destination Inspection of Small Limited Quantities of Cement.

1019.3.3.1 When destination inspection of small limited quantities of cement is permitted, the inspector shall sample the cement in accordance with Paragraph 1019.4.4 or 1019.4.5 of this Section, as applicable for bulk or packaged cement. The cement offered for inspection shall not be used until tested and approved by the Laboratory. Cement showing any appreciable amount of caking or storage hardening shall not be sampled or used. The sample shall be shipped to the Central Laboratory in a canvas bag containing a plastic liner. Complete a sample record in SiteManager showing the manufacturer and other pertinent information such as source, contractor, project or precast plant, and intended use.

1019.3.3.2 The district is to insure that the qualified manufacturer is certifying each shipment in accordance with Specification Sec 1019, including all requirements for signatures and shipments from other entities.

1019.3.3.3 Where test reports are necessary in the District as a basis of acceptance or rejection of small limited quantities, place a note in the remarks of the sample report similar to the following: "Small limited quantity of cement - please furnish test report."



1019.4 SAMPLING.

1019.4.1 Sample Portland cement by the methods specified herein. A sample shall weigh a minimum of 5 pounds [2.5 kg]. Samples obtained in one operation and representing a brief period in the cement stream shall be termed a "grab sample". Samples obtained by means of an automatic device that continuously samples a cement stream for either a short or extended period shall be termed a "continuous sample".

1019.4.2 Samples may be taken from a conveyor delivering cement to bulk storage by either the grab or continuous method.

1019.4.3 Samples may be taken from bulk storage at points of discharge by either the grab or continuous method. If a high circular silo is being sampled, all samples may be taken from one opening. When low rectangular bins are being sampled, the number of discharge openings employed in sampling shall be such that for no opening shall the number of samples represent more than one half the contents of the bin. Sampling from a discharge opening shall cease when any materials which have been placed on top of the cement in the bin or silo pass through the sampling opening.

1019.4.4 Samples taken from bulk storage, bulk shipment of railway car, truck, or other transportation unit should be by the grab method. A sample taken from bulk storage shall be taken from at least three well-distributed points. A sample taken from bulk shipment may be obtained from one point in the car, truck or other transportation unit, including the top. Sampling device may be a tube sampler, scoop or any other device suitable for obtaining the sample.

1019.4.5 Take samples from packaged cement by the grab method using a tube sampler. A sample taken from packaged cement shall be taken from at least three bags.

1019.5 SAMPLE RECORD.

1019.5.1 Report of Laboratory test results on random samples of cement originating from a qualified manufacturer will not be distributed unless specifically requested and conditions warrant this information for a specific purpose. Laboratory test results on small limited quantities of cement will be reported and distributed as shown in [Laboratory Sec 1019](#) of this Manual.

1019.5.2 The receiving district Operations Engineer shall continuously monitor shipments to the particular ready-mix or paving plants to assure that sufficient inspected and certified cement is being shipped from an approved source.

1019.5.2.1 Perform a review of each plant's inspector's daily report data at regular intervals not to exceed one week. Verify that enough tickets are shown to account for the amount of cement used and that the supplier and type are shown on the list of qualified sources. If the report does not contain the required information, notify the district Operations Engineer.